

Diabetes Telehealth in the 21st Century: Log In to the Future of Medicine

Preface

Stephen W. Ponder, MD, FAAP,
CDE, Guest Editor

The era of diabetes telehealth began with the first telephone call from a health care provider to a patient with diabetes, followed years later by a facsimile (fax) of patient-collected data (most likely urine glucose results and insulin doses) to a physician's office sent from a patient's workplace or home. The dates of those events have been long forgotten, but interacting with patients remotely via electronic means has exploded during the past 20 years with the establishment of personal computing, the Internet, and wireless communication technologies. The result has been an array of innovative modalities for diabetes health care teams to use for interacting with patients, whether they are located anywhere on the planet or just across the street.

Diabetes care is largely a cognitive discipline. Providing timely education and self-management counseling to patients has always been a crucial element of successful outcomes. The archetypical example of a sustained application of telehealth was the Diabetes Control and Complications Trial (DCCT), which began more than 30 years ago. For more than a decade, subjects in the intensive treatment arm of the DCCT were contacted weekly by telephone to discuss progress and make adjustments to management.¹ This was in the era before popular use of e-mail, webcams, cell phones, text messages, or the Internet.

Now that we are well into the 21st century, it is time to recognize the increasing role of remote-access technologies today and the more prominent role they will play in the clinical arsenal of diabetes educators and health care providers and in health care population management systems in the future. The rising cost of health

care delivery continues to be the primary driver of decision-making on the micro- and macroeconomic levels. Using remote communication, education, and training technologies to contain costs while maintaining quality are commonplace in the business world. The extension of these principles to medicine was inevitable. Health care reform legislation and U.S. budget priorities have given greater impetus to finding cost-effective methods for providing high-quality access and outcomes for patients with all forms of chronic and acute illness. Telehealth will be the future of diabetes for the next several decades. It is already integrated into many practice models, as described in this *Diabetes Spectrum* From Research to Practice section.

I have very much enjoyed serving as guest editor for this research section focusing on diabetes telehealth. We have selected authors with in-depth knowledge of and experience with emerging trends in diabetes telehealth. Their contributions address all angles of remote patient interactions and their effects on people with diabetes with regard to self-management education, access to direct patient care, patient information, and data-sharing.

Mobile health computing (mHealth) is the wave on which we now ride. mHealth is driven by the integration of smartphones, tablets, web books, and laptops into the fabric of daily life. Soon, desktop personal computers will suffer a fate similar to those of eight-track tape decks and telephone booths. The fast track onto the information superhighway now rests in the palm of our hands.

According to the Pew Research Center's Internet & American Life Project,² in 2013, 56% of Americans owned a smartphone. The rise of

smartphone technology has ushered in the era of mobile applications, better known as “apps,” which have exploded on the scene in the past few years. But as popular as apps have become, few have been put through the rigors of evidence-based medicine. Most never will.

In this issue, Ryan A. Ristau, BS, Jessica Yang, BA, and John R. White, PA-C, PharmD, report that there are in excess of 2,250 diabetes-related apps for Apple iOS and 1,600 for Android smartphone operating systems. Their article (p. 211) provides a primer on how to evaluate current diabetes smartphone apps and match patients to apps that can best meet their individual needs.

Because the world of apps is not directly under the purview of the U.S. Food and Drug Administration, it is important for consumers to apply a generous dose of caution when using them. As with any other new tool, it is always important to consider sustainability and not novelty when assessing the usefulness of these self-care adjuncts. Apps are a rapidly emerging technology; it is premature to judge their long-term impact. However, this article provides a framework for approaching the use of diabetes apps in clinical care.

The heart of diabetes care is the delivery of quality, timely self-management education to patients and families. Because of suboptimal reimbursement, our present health care delivery system falls woefully short in providing enough access to ongoing diabetes education, given the amount of coaching and information most patients truly need. The length of time for most diabetes follow-up encounters ranges from 15 to 30 minutes.

Although the Internet encompasses more collective knowledge than several Libraries of Congress, it is usually not formatted in such a way as to be an effective diabetes education platform for the majority of patients. In our second article (p. 215), Gary Scheiner, MS, CDE, discusses how effective diabetes education can be delivered through a web-based platform using a variety of multimedia formats. Individual video chats, webinars, and interactive platforms can now put patients in direct contact with an experienced diabetes education program from anywhere in the world with only a few mouse clicks. Engaging patients via video

is cost-effective for providers and patients, can enhance patient safety, reduces concerns about no-shows or late-shows to appointments, and can provoke less anxiety.

Scheiner outlines all the actions that can be accomplished via two-way video. There remain some limitations of virtual at-home visits, including reimbursement. But these barriers are slowly being overcome. Taking the plunge into virtual care can be done today without the huge financial investments of just 10 years ago. It is also scalable. And for readers who do not have video at the top of their list, Scheiner also reviews the array of existing data-linkage systems for transferring data from insulin pumps, blood glucose meters, and continuous glucose monitors for review and interpretation at medical practice clinics.

The passage of the 2009 stimulus package and the 2010 Affordable Care Act (ACA), and the subsequent upholding of the ACA in the U.S. Supreme Court, have irrevocably altered the course of health care delivery in the United States. Improvement in patients' access to their own medical data is one of the multitude of changes to health care delivery provided through the health care reforms initiated by Congress and the Obama administration. In our third article (p. 221), Teresa L. Pearson, MS, RN, CDE, FADE, takes us through the inner workings of the ACA as it relates to diabetes telehealth. In fact, much of the recent emphasis on diabetes telehealth is a direct result of the passage of the ACA. The fates of diabetes telehealth and the ACA are strongly intertwined.

Before the ACA, there were well-known limitations to access to specialty care for patients with diabetes in many areas of the country. Qualified specialists are often physically far removed from the patients who need them most. There is significant heterogeneity in access to board-certified pediatric endocrinologists in the United States. Patient-provider ratios vary from 370:1 in the Midwest to 144:1 in the Northeast, with two states lacking any board-certified pediatric endocrinologists.³ Specialty outreach clinics attempt to address this gap, but costs and limited time at these sites are shortcomings of this approach.

One of the early concepts of high-tech diabetes telehealth began with clinic-to-clinic telemedicine models.

Toree Malasanos, MD, was an early originator of this model and has led the Florida Initiative in Telehealth and Education since the mid-1990s. Her program has a published record of clinical and financial success and serves as a model for others. For our next article (p. 226), we asked her to describe her program's journey to success and review the literature describing comparable site-to-site programs around the globe. Her article provides a thorough description of how to start a diabetes telehealth program, complete with discussions of privacy, licensure, and overcoming technophobia. As health care systems begin to embrace telehealth as a means to hold down the costs of health care delivery, she describes how such programs can effectively serve disadvantaged populations while reducing expenses for patients with diabetes and their providers.

Online social media are only a few years old, yet they have already rewritten the processes by which millions of people interact with each other outside their home and office settings. In many ways, the social media phenomenon has fostered a culture unto itself with specific rules of etiquette and engagement. In the final article of this research section (p. 232), diabetes telehealth consultant Kevin L. McMahon, BS, describes the powerful nature of social media as they relate to diabetes.

Understanding and harnessing this power is not for the uninitiated. He outlines the fickle and at times furious nature of social networking and how it can complement quality self-care—or totally undermine everything health care providers seek to accomplish. But even those who never “like” a Facebook page or re-post a tweet need to understand how social networking influences patients' information-gathering and -sharing within the diabetes community. With a humorous touch, McMahon guides readers through this world, offering practical examples to help providers create their own online presence if they choose to do so.

Health care is undergoing a digital reformation. Like any paradigm shift, this will be challenging for many of us. Telehealth is now embedding itself into diabetes care and education at a rapid pace. In the near future, e-visits will be the norm and not the exception. As long as provider-patient

relationships can be preserved in this changeover, diabetes telehealth is here to stay. mHealth was made possible by the Internet, followed by the rise of smartphones and tablet-based personal computing platforms. This *Diabetes Spectrum* From Research to Practice section has been strategically developed to help readers become poised and best pre-

pared for 2014 onward, when health care reform reshapes the world of diabetes care.

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